DoN Corporate Approach to Simulation Based Acquisition (SBA)

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SBA Assessment

- **Leadership consensus that SBA will improve acquisition**
- **Technical & cultural challenges are real, must be addressed**
- **Many Navy programs are implementing aspects of SBA**
  - **will yield valuable lessons**
- **Many related initiatives with overlapping goals**

…but still significant confusion about what SBA is, is not

…thus scope of challenges breeds many skeptics

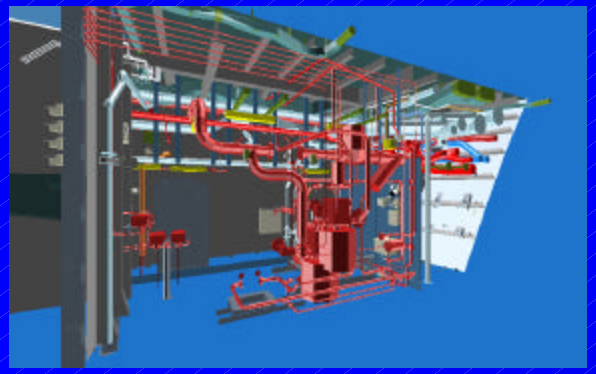
…despite absence of approved source documents, common plan
  - **so, like industry, most program efforts are stovepipes**

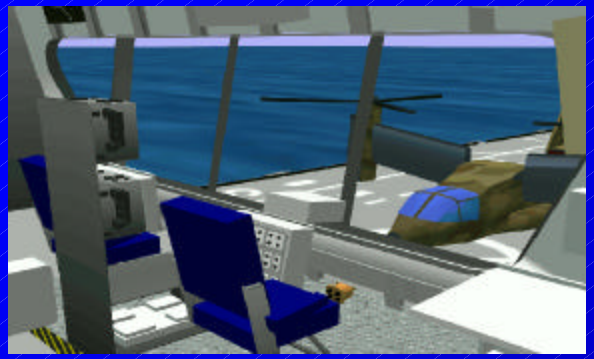
…attempting to understand and adopt them increases the PM's workload and frustration

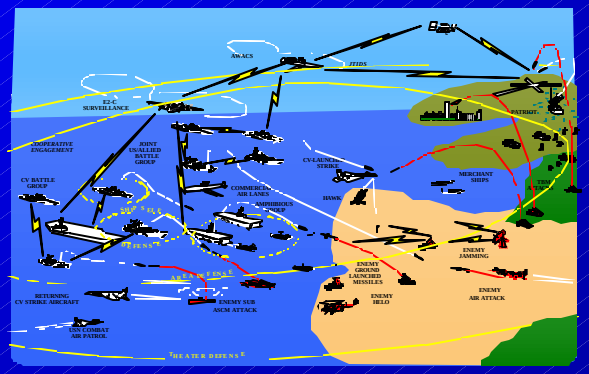
- Significant Progress
- Many Challenges & Opportunities
- Comprehensive Action Required

Our Task

- **Develop a campaign plan to:**
  - **Realize the goals of SBA and related initiatives in a harmonized way**
  - **Contain cost by leveraging on-going projects/initiatives and standards activities, both government and commercial**
  - **Elicit DoN, PM and industry support and investment**
- **Coordinate execution of the plan**
- **Deliver real value to PMs, DoN, DoD, Industrial Base**





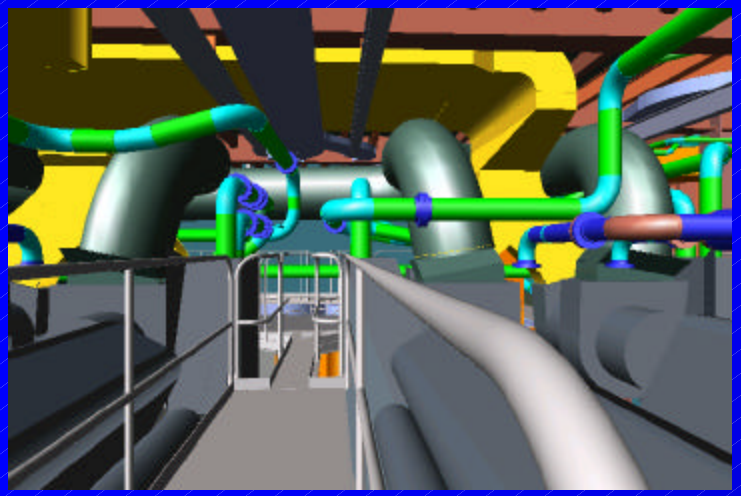


Navy Programs and Projects

Contributing to and/or Influenced by SBA

Acquisition Programs

- Joint Strike Fighter
- DD 21
- LPD-17
- AAAV
- Virginia Class SSN
- CVX
- Undersea weapons



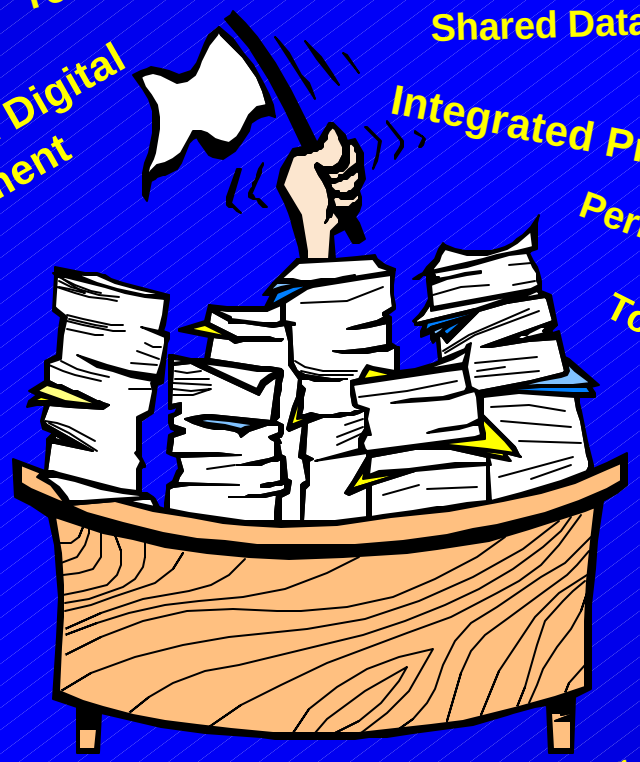
Stand-alone Projects

- MARITECH Advanced Ship-building Enterprise (ASE)
- Navy/Industry Digital Data Exchange Standards Committee
- NATO Specialist Team for Warship Simulation Based Design and Virtual Prototyping
- Distributed Engineering Plant
- MIT's Distributed Object Modeling Environment (DOME)
- Naval Enterprise Data Standards (NEDS)
- Leading Edge Advanced Prototyping System (LEAPS)

Some Other SBA-Related Activities

- Integrated Digital Environment
- Life-cycle Integrated Product Data Environment (Logistics Foundation project)
- Performance Based Business Environment - Product Description Data
- DLA Integrated Data Environment
- Joint Computer-Aided Acquisition and Logistics Support (JCALS)
- Integrated Manufacturing Technology Initiative (DoD, DoC, NIST, NSF, DOE)
- Interoperability Clearing House
- Knowledge Management Initiatives
- Affordable Multi-Missile Manufacturing (DARPA Agile Manufacturing)
- Complex Systems Engineering (FY00 congressional add under DUSD(L))
- NRC & IDA studies (Advanced Engineering Environments; Complex Product Realization 2020)
- Public Key Infrastructure (PKI)
- NASA's Intelligent Synthesis Environment
- UK's Synthetic Environment Based Acquisition
- University projects (e.g., MIT Center for Innovative Product Development)
- Collaborative commercial e-commerce marketplace ventures
- A plethora of data interchange standard development efforts
  - DoD Data Administration Program; DII-COE Shared Data Environment; JECPO Product Data Mark-Up Language (PDML); NIST Knowledge-based Interoperability Project; NIST Process Specification Language; various XML Document Type Definitions; emerging XML Schema standards; etc.

The PM's Perspective



Agile Manufacturing

Knowledge Management

Lean Initiatives

Simulation Test and Evaluation Process

Total Asset Visibility

Lifecycle Integrated Product Data Environment

Simulation Based Acquisition

Shared Data Environment

Integrated Data Environment

Integrated Product and Process Development

Performance Based Business Environment

Total Quality Management

Cost As an Independent Variable

Computer Aided Life-cycle Support (CALS)

Open Systems Approach

Concurrent Engineering

Commercial Practices

Integrated Manufacturing Technology Roadmap

Full Service Contractor

Single Process Initiative

PKI

Paperless Contracting

Smart Product Models

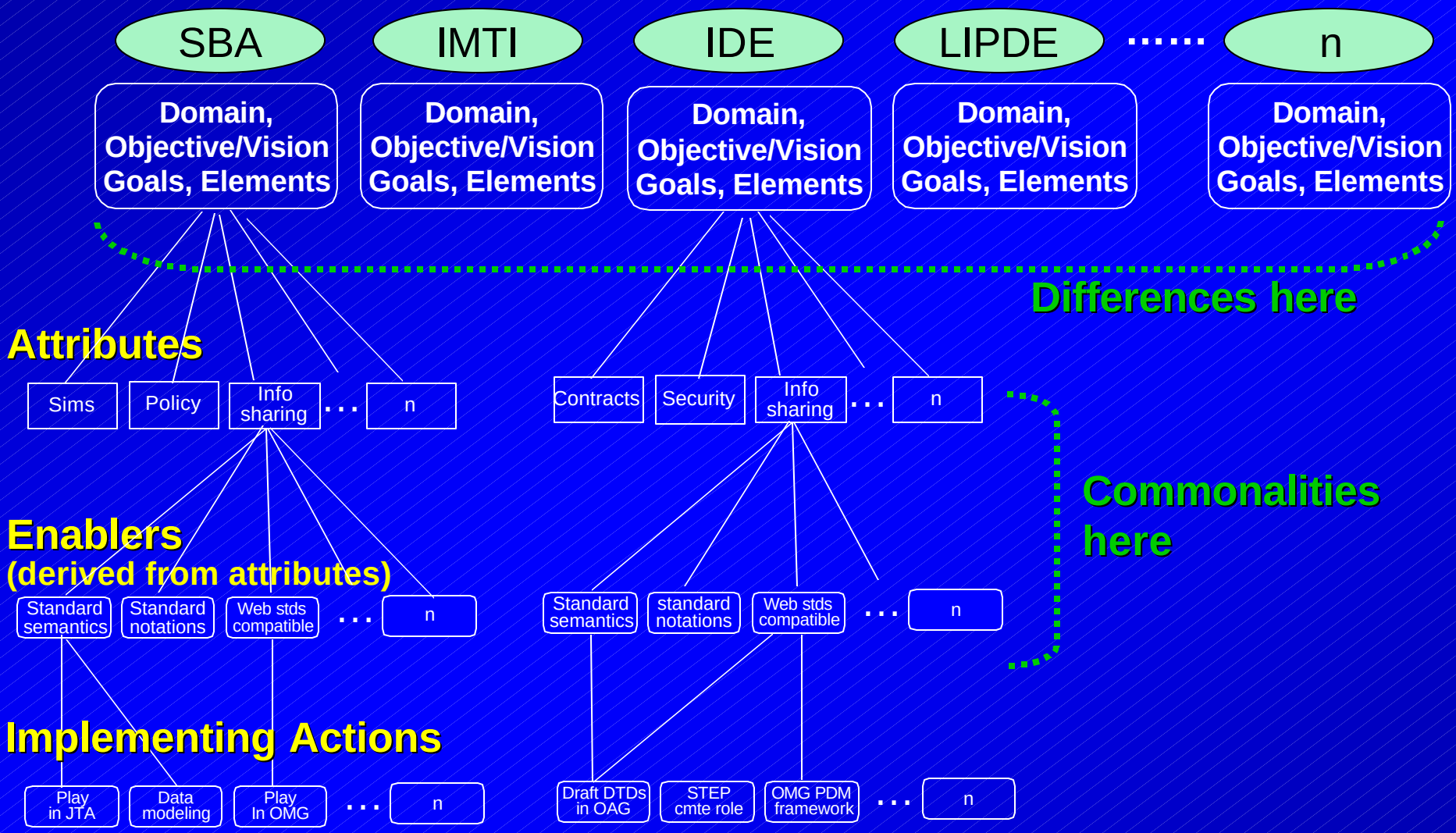
Integrated Digital Environment

Integrated Product Data Environment

They Share Similar Attributes

- Multi-domain (e.g., performance, cost, supportability) optimization by opening up the trade space across the system's full life cycle
- New collaborative processes across an extended enterprise
  - Distributed teams (IPTs) of key stakeholders
    - Customers/warriors, suppliers, maintainers, etc. in the loop
  - Sharing common, coherent & relevant information/knowledge
    - Institutional, domain, product and/or processes
- Overcoming complexity and cost by leveraging IT advances
  - Processing, storage, networks/Internet
  - Modeling, simulation, visualization, data mining
- Protection of classified and proprietary information
- High reuse of info, tools, & services; minimal duplication

Considering the Activities



Compare to determine:

1. **Overlaps (inviting leverage/coordination/adjustments)**
2. **Holes (inviting action/partnerships)**

Some Common Enablers (1 of 2)

- Policy, law and process changes, such as:
  - Delineation of responsibilities and liabilities regarding reuse of info/tools
  - Revised budgeting methods, new contractual procedures and language
- Education and motivation to affect cultural change
- Coherent information sets in a common, accessible form
  - Common information models for classes of systems and transactions
  - Data engineering methods and notations, coordination
  - Identifying authoritative information sources
- Data interchange standards
  - Advocacy with commercial standards bodies (e.g., OAG, OMG, OASIS)
  - Parsed information models as commercial standards (e.g., XML DTDs)
- Efficient collaboration mechanisms
  - PDM tools with subscriptions and triggers; newsgroups; tools to weigh measures of merit; balloting management; etc.

Some Common Enablers (2 of 2)

- Capable, reusable models, simulations and federations
  - Conceptual models and persistent federations for different domains
  - The required models and simulations
- VV&A procedures, documentation and compliance
- Bulletin boards and repositories to find re-usable resources
- Motivation for original developers to support re-use
  - E.g., mechanisms for pay-backs to developers for re-use by others
- Access/security control mechanisms
  - Public Key Infrastructure, encryption, etc.
- Business Case
  - Cost-benefit methods, metrics, anecdotes, studies

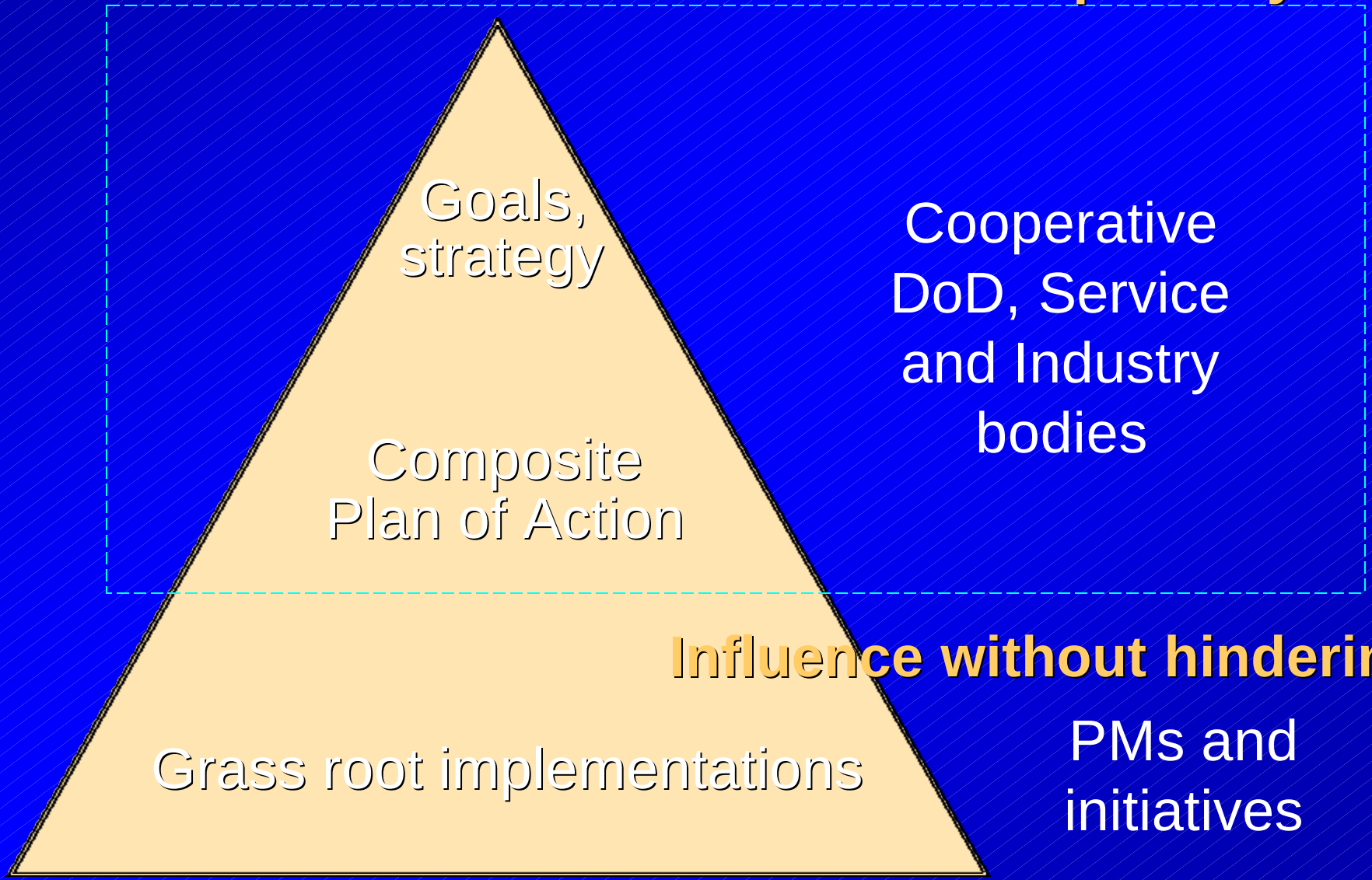
The Baseball Pool Approach

	Enabler A	Enabler B	Enabler C	Enabler D	Enabler E	Enabler F	Enabler G	Enabler H
Policy & process		USA			JECPO		NDIA	
Content	USN		NIST	DMSO	ISO	USN		OMG
Infrastructure (e.g., tools)	JSF	DARPA		USA		NASA	NSA	

Options:
- Harvest/share
- Influence/adjust
- Start/develop

Management Strategy

Address corporately



Funding

- Much existing activity/funding can be leveraged
  - Any necessary additional investment may be small
- SBA ROI occurs at two levels:
  - Within programs: faster and smarter decisions, less cost, better product, more efficient T&E, etc.
  - Corporate level: system of systems analysis (wiser investment), more affordable programs, greater market share
- Funding is needed at both levels
  - PM investment will flow from practical proofs, business case, exposure to viable solutions
  - Corporate investment will flow from recognition that some enablers are beyond the reach of individual programs
    - ARO currently funding the planning effort
    - PPBS battles to follow after assessment & plan achieve consensus